DOCUMENT RESUME

ED 081 383 HE 004 566

AUTHOR	Balderston, F. E.
TITLE	Varieties of Financial Crisis.
INSTITUTION	California Univ., Berkeley. Ford Foundation Program for Research in Univ. Administration.
SPONS AGENCY	Ford Foundation, New York, N.Y.
REPORT NO	Pap-P-29
PUB DATE	Mar 72
NOTE	34p.
AVAILABLE FROM	Ford Foundation, 2288 Fulton Street, Berkeley, California 94720
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Costs; *Educational Economics; *Educational Finance; Federal Aid; *Financial Problems; Financial Support; *Higher Education; Models

ABSTRACT

The various forms of financial stress that academic institutions may face are examined. The Earl Cheit and Alice Rivlin concepts of financial stress are reviewed. The author then offers five conceptually different models of financial stress which are briefly discussed: (1) expanded academic aspiration; (2) time passing; (3) stabilization after growth; (4) conscientious overcommitment; and (5) income tapering. The cost trends in various academic operations are described and the major educational resources used in terms of costs are reviewed. The author concludes that the Federal Government is the only source that can alleviate financial problems facing higher education. (Author)

FILMED FROM BEST AVAILABLE COPY

ED 081383

FORD FOUNDATION PROGRAM FOR RESEARCH IN UNIVERSITY ADMINISTRATION

Office of the Vice President—Planning
University of California

HE 004 566

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

FORD GRANT NO. 680-0267A

RESEARCH DIRECTORATE

Charles J. Hitch — President, University of California

Frederick E. Balderston — Professor of Business Administration
Chairman, Center for Research in Management Science
University of California, Berkeley
Academic Assistant to the President

OFFICE ADDRESS

2288 Fulton Street
Berkeley, California 94720
(415) 642-5490

ED 081383

VARIETIES OF FINANCIAL CRISIS

Frederick E. Balderston

Paper P-29

March, 1972

TABLE OF CONTENTS

	Page
PREFACE	ii
INTRODUCTION	1
FINANCIAL STRESS DEFINED AND EVALUATED	2
As Defined by Cheit	2
According to Rivlin	5
FIVE MODELS OF STRESS	6
COST TRENDS IN ACADEMIC OPERATIONS	11
Trends in Unit Prices	12
Salary Trends for Various Types of Labor	13
Two Inferences	15
Trends in Commodity Prices	16
Prices of Library Materials	18
EDUCATIONAL RESOURCES USED	19
Increases in Personnel	20
Library Growth	22
Equipment	23
Security Cost Rise	24
Student Financial Aid	24
AN APPRAISAL	25
EPILOGUE	28

PREFACE

This is one of a continuing series of reports of the Ford Foundation sponsored Research Program in University Administration at the University of California, Berkeley. The guiding purpose of this Program is to undertake quantitative research which will assist university administrators and other individuals seriously concerned with the management of university systems both to understand the basic functions of their complex systems and to utilize effectively the tools of modern management in the allocation of educational resources.

This paper was presented to the American Council on Education Annual Meeting, Fall 1971 and will be included in the forthcoming book published by the Council on that meeting. An extension to the previous analysis of institutional cost patterns is presented in this paper.

INTRODUCTION

Many colleges and universities are already facing several crises simultaneously: a crisis of internal governance and control; a crisis of confidence with major external constituencies; a crisis of philosophy and mission; a crisis of market position; and a crisis of money. We can, in fact, expect that a sufficiently serious state of stress in any one of these areas will be communicated to the others, particularly to the financial area. And, the realities being what they are, ability to address problems in the other areas of deep concern in the hope of overcoming them will often depend on whether money problems can be solved or at least alleviated.

This paper will examine the various forms of financial stress that academic institutions may face. The term "stress" is preferred to "crisis" because the latter implies a peak of tension and then its end: death, or transfiguration, or sudden discovery of gold at the end of a money-raising rainbow. Most students of higher education finance are agreed that there is only one source large enough and powerful enough to help all of the institutions now facing financial stress. His name is Uncle Sam. To produce a permanent easing of financial stress in higher education, the federal government would have to change its policies for educational finance in some very basic ways that would add up to several billions of dollars per year of federal money. An example would be the changes in federal policy generated by a decision calling for the immediate adoption of the major portion of the various Carnegie Commission recommendations or of the recommendations of the Rivlin Report.[1]

---

[1] Toward a Long-Range Plan for Federal Financial Support for Higher Education: A Report to the President (Washington: U.S. Department of Health, Education, and Welfare, Assistant Secretary for Planning and Evaluation, 1969).

We can all hope that as the executive branch and the Congress move during the next couple of years to review the financial problems of higher education, key elements of these recommendations will indeed be adopted. Yet no college or university president should simply wait for that to happen. A more reasonable forecast is that, whatever the improvements and changes in federal policy, we will see no basic change in the structure of higher education finance but rather a number of piecemeal ameliorations. The basic pattern of financial stress will likely persist through the present decade.

FINANCIAL STRESS DEFINED AND EVALUATED

How did financial stresses accumulate in a variety of types and sizes of institutions? Why did these stresses show themselves suddenly and almost simultaneously within the last three years or so, especially since the early 1960's had not revealed obvious evidence of financial trouble in most colleges and universities? What are the specific varieties of financial crises to which the institutions concerned and their constituencies must seek solutions?[2]

As Defined by Cheit

Earl F. Cheit arrived at a particular definition of financial stress in his recent Carnegie Commission monograph, The New Depression in Higher Education.[3] Many public institutions are required by law or state

[2]Virginia Smith's paper, "Institutional Economics," will explore some of the possibilities in alleviating these financial maladies. My task here is limited to that of diagnosis.

[3]New York: McGraw-Hill Book Co., 1971.

financial regulation to keep current expenditures within current income; in other words, they are not allowed to run an operating deficit even though they may find their financial resources seriously inadequate. Some private institutions do, from time to time, dip into capital or reserves--run an operating deficit--without feeling that they are in long-range financial difficulty. Cheit cites the academic truism that each institution may expect to spend for current operations up to its current income. Neither good financial stewardship nor effective academic management generally requires an institution to more than "break even" each year.

Cheit therefore felt that the presence or absence of an operating deficit is not a good litmus test of financial difficulty, and that the right test is the adequacy of resources in relation to the institution's mission. He said, "For purposes of this study, an institution is judged *in financial difficulty* if its current financial condition results in a loss of services that are regarded as a part of its program *or* a loss of quality" (Cheit's italics, p. 36). He points out that his definition accepts the institution's own definition of its educational mission and academic quality standards. If its resources are inadequate to sustain it in that mission and at that quality, then it is in financial stress. Given the wide variety of institutional types, sizes, and missions in American higher education, it is hard to set forth an external, objectified measure to replace the self-definitions of financial situation given by the individual institutions. Thus, we have no convenient and operational test of financial viability to apply directly to the observable accounting picture of an institution.

Cheit's findings are aptly summarized in the title of his monograph, The New Depression.... He assembled data on costs, income, and enrollment

trends and also gathered detailed interview information on a total of forty-one institutions classified into six groups, ranging from seven "national research universities" to five "two-year colleges." He conducted most of the interviews that comprised his field work, and was assisted by several people, including myself, who interviewed presidents and other senior officials at some of the institutions. Although he emphasizes that this study cannot purport to be a strict statistical analysis applicable to all of American higher education, it was a serious effort to assess the situation for a group of institutions representing all of the major types.

Cheit recently summarized for Representative Edith Green's Special Subcommittee on Education what he found:

> Almost three-fourths of the schools studied (71 percent) were either in financial difficulty or headed for it. The Carnegie Commission staff estimates (by a national projection of my sample) that two-thirds of the nation's colleges--enrolling three-fourths of the nation's students--are in financial difficulty or headed for it.
>
> My study found that all types of institutions are affected. The major private universities have been hit first, but the others are not far behind. Public and private alike are facing increasing financial trouble. No class of institution is exempt from the problem or free from financial trouble.[4]

He went on to describe the logic of the cost-income squeeze--a gap of several percentage points in the trend of cost per student per year versus income per student per year--facing different types of institutions, and suggested that

> the nation's colleges and universities need between $300 and $700 million in additional operating income. When we recall that this would come from federal, state, local, and private sources in 50 states, it is hardly a frightening sum.

And he concluded by urging the need for new federal programs both to assist the student and to provide institutional support.

---

[4]Testimony of Earl F. Cheit before Special Subcommittee on Education, Committee on Education and Labor, U.S. House of Representatives, March 29, 1971.

According to Rivlin

Alice Rivlin, in still more recent testimony before the same congressional committee, posed the question whether there is really an emergency or crisis in higher education finance, and then said:

> Hard facts are difficult to assemble in this area. My own impression from available studies and conversations with higher educators is that there is no *general* [her emphasis] crisis of higher education finance.

She noted:

> There are several sets of factors affecting various kinds of institutions in various ways at the same time, some permanent and some temporary.
>
> 1. Some major research institutions are suffering from cutbacks in federal research programs or federally funded graduate programs. . .
> 2. Some, but by no means all, state-supported institutions are suffering from smaller than usual increases in state support. . .
> 3. Some institutions, especially private ones, are finding themselves over-extended as a result of ambitious attempts over the last decade to improve the quality and variety of their programs. . .
> 4. Some institutions are suffering the combined effect of recent recession and inflation. Private institutions are the hardest hit. Private gifts have dropped sharply, although they seem likely to recover somewhat this year. Students are less likely in a recession to pay the difference between public and private tuition. At the same time, wages, salaries, and other costs have continued to rise steeply.
> 5. Some institutions no longer offer what students appear to want. . . [5]

Dr. Rivlin concludes this litany of woes with the observation:

> It is certainly not obvious that a program of general support for higher education is the appropriate answer to all or even most of these varied financial problems.

These different, or differently shaded, views of the nature and trend of financial position are cited to show the differences in judgments of

---

[5] Testimony of Alice Rivlin, Brookings Institution, before Special Subcommittee on Education, Committee on Education and Labor, U.S. House of Representatives, April 1971.

qualified experts on the economics of higher education, and they also point the way toward what may be needed for further diagnosis of the "varieties of financial crisis."

FIVE MODELS OF STRESS

First, I offer several conceptually different models of financial stress and discuss each of them briefly:

1. Expanded academic aspiration
2. Time passing
3. Stabilization after growth
4. Conscientious overcommitment
5. Income tapering

Each of these is a stress model for the individual institution of higher education, and any one institution may have some combination of these stresses accumulating at the same time. After commenting on each model, I shall take up trends in unit prices and volumes used of the different kinds of institutional resources. Next, I shall apply the lessons about trends in costs to the various types of institutions, and then join the observations about cost structure with comments about income trends and problems.

At that point, I shall hope to have arrived at an answer to each of the following questions: (1) Have cost trends affected the several types of institutions in different ways? (2) Have income trends affected these institutions differently? (3) What aspects of their financial stresses will be temporary, and what aspects will be permanent--last until at least 1980!--in the various types of institutions?

Expanded Aspiration. Here is what an institution needed to do to achieve the first kind of stress: It established a number of new programs in areas of hot competition and (almost by definition) recruited key faculty from a limited supply, ahead of enrollment growth. It developed new programs especially in areas of growing prestige--doctoral programs requiring heavy library or laboratory investment and substantial fellowship funds to enable it to compete successfully for good students who would redound to the prestige of the program and the institution. This was done in many program areas in order to move the institution upward in academic status, but also, inevitably, moving it outward toward the fiscal cliff.

Time Passing. This model is closely related to the stress from *stabilization after growth,* which might also be labeled "rising fixed commitments." It is almost breathtakingly easy to experience stress from *time passing*, for two reasons: aging of the institution, and differentially growing cost factors that push up institutional costs relative to income. Consider the institution having, say, in base year 1960, three components of operating expenditure: *A*, amounting to $500,000; *B*, amounting to $250,000; and *C*, amounting also to $250,000. Let component *A* grow in cost at the compound annual rate of 4 percent, component *B* at 6 percent, and component *C* at 8 percent. By 1970, the $1 million total budget back in 1960 will have grown to a total budget of $1.74 million, with *no* change in actual operations or their productivity. An annual rate of income growth of 5.75 percent would have been just sufficient to offset the cost rise. But if in a second institutional example the three components had been equal in 1960 at $0.33 million each, and if the growth in costs had been the same as in the first example, the budget would have grown to

$1.83 million, or 5 percent more than in the first case.

These differences in cost structure are not chosen accidentally, nor are the different rates of cost growth. Component *A* could well be faculty wage bill, component *C*, maintenance of fixed plant plus library, and component *B*, all other overhead. The first example above could be an undergraduate college, and the second (the example of three equal components in 1960), a university.

"Simple aging" is the other aspect of the model of time passing: the increase of age and rank distributions of faculty, increase of seniority of administrative staff, increased age and maintenance requirements of buildings. To avoid upward cost pressure over time in each of these categories, an institution would have to put into effect some positive policies that are very difficult for it to conceive and enforce. To illustrate the issue of aging of faculty, let us assume that the institution has gone through a period of expansion in which mostly junior people were added to faculty so that at the beginning of the decade 50 percent of the faculty was nontenured, 10 percent consisted of associate professors, and 40 percent were (youngish) full professors. Now let ten years pass, with *no* change in the total number of positions. In each year, let us say, one-fifth of the nontenured faculty comes up for promotion to associate professor, of whom three-fourths make it and one-fourth are replaced by new assistant professor appointments; one-fourth of the associate professors comes up for promotion to full professor, and three-fourths of them make it; the rest remain as associate professors; and among the full professors (because the faculty is young), nobody reaches retirement age.

By the end of the tenth year, here is the situation: the rank distribution is 10 percent assistant professors, 15 percent associate

professors, and 75 percent full professors.

Stabilization after Growth, or Rising Fixed Commitments. This model of financial stress can be seen as one in which the potential for trouble is primed by a substantial interval of past growth--growth in which significant numbers of new faculty and staff were added, mostly at the junior levels, and capital facilities in copious quantity were added while no old buildings were torn down (pressure of growth forced continued use of old buildings). Underlying the expanded institution is a rising level of budget for administration, for libraries, and for computer centers. With this priming force, the cost structure of the institution and the age distribution of its faculty and capital facilities can hardly fail to produce later rapid increases of costs. Here is the basis of crisis--the cost increases will not have been foreseen at the time of the expansion because the early budget years of the expansion could be financed at low entry costs.

There is an interesting corollary to this model of stabilization: if the institution had been able to keep growing, it could have put off the evil day. But to do so, it would have had to grow at more than a linear rate in total faculty, total building space, and so on, and keep income growing at least proportionally with enrollment growth. And what institution can do all that indefinitely? Correspondingly, we can predict that any institution that has been growing will begin to be hit by the stresses of stabilization shortly after its growth tapers off.

Conscientious Overcommitment. This model is also a familiar one. In recent years, many colleges and universities increased their financial aid to students, not only to offset for needy students the effects of rising tuition, fees, and other costs of attendance but also to attract

Black, Chicano, and other minority students previously excluded from college-going opportunities. Once entered into, the commitment to the individual student cannot be cut back, and the institution's first-year program commitment grows rapidly with each new group of students admitted. These financial aid budget obligations, as Cheit points out, are a major source of cost increase for many colleges and universities.

Again many colleges and universities, particularly in urban areas, have sought, or had thrust upon them, increased community responsibilities. These, too, are sources of budgetary strain.

Conscientious commitments of an institution need not constitute a large fraction of the budget to produce a financial crisis. If the costs are enough to produce imbalance when added to ongoing budget, and particularly if they grow at a more rapid percentage rate than other costs, they are enough at the margin to cause severe financial stress.

Income Tapering. The preceding types of crisis deal with the dynamics of prices, costs, and expenditures. This last model is concerned with trends in income and the possibility that some income components are not sufficiently responsive over time to enable an institution to keep up with its cost pattern.

Cheit noted in his study of forty-one institutions that, overall, income trends had failed to keep pace with expenditure trends. Private institutions are hit by two basic income problems: the hazard of pricing the institution out of the market through tuition increases, and the declining purchasing power of endowment income. The latter may be offset by increased annual giving and by new capital gifts, but in recent years increasing tensions between private institutions and their alumni and other donor constituencies have dampered income growth from gifts.

Potential market resistance to increases in attendance costs--tuition, fees, dormitory charges, and other costs of attendance--is especially serious for private institutions that encounter increasing competition from publicly supported colleges and universities with lower fees and with enrollment spaces and political commitment to take all of the new applicants who meet their admission standards.

Universities face an additional problem. In the past few years extramural research funds from federal agencies and foundations have grown more slowly, or, for some universities, have actually declined. Most seriously affected are institutions that have counted on a portion of the direct costs of research to buttress academic salaries (and now must find other funds to meet these basic commitments) and those that have come to depend on the overhead (indirect cost recovery) rate as the budgetary base for other major institutional services--from libraries and computer centers to building space and general administration.

COST TRENDS IN ACADEMIC OPERATIONS

What are the various activity and program components in an institution's cost structure? To be considered are: the unit price of each type of resource used in the activity, and the trend in that unit price; the trend in the quantity used of each resource; and, because productivity rates of some resources improve over time while others may decline, the effect of productivity changes on the amount of service that the activity or program actually contributes to the institution.

There are, of course, many serious problems of data, of interpretation of the measures of both quantity and quality of each resource used,

and of measures of the quality and quantity of services contributed. Academic institutions vary greatly from one another and differ from other types of economic institutions in their location in labor and other resource markets, in their uses of resources, and in their perceptions of the quality and quantity of the services produced in their activities and programs. The best that can be offered here is a series of clues and judgments about the financial stresses caused by cost trends.

Trends in Unit Prices

We can look first at the trends in unit prices. Labor costs, according to the traditional rule of thumb, account for about 80 percent of an academic institution's operating budget, and so will be examined first. The general trend of faculty salaries has been recorded in the annual surveys of the American Association of University Professors. Salary trends for other categories of personnel in higher education have not been studied in the same detail, however, and are difficult to examine on an appropriate comparative basis because of wide differences in the definitions of administrative and staff positions and differences in labor market conditions throughout the country.

Committee Z (Economic Status of the Profession) of the AAUP reported in April 1970 that average faculty salaries for all ranks had risen, after correction for inflation by only 1.1 percent for the year from 1968-69 to 1969-70. (By contrast, in various years from 1955 to 1967, real faculty purchasing power had shown growth rates ranging from 3.2 percent to 4.4 percent per year.)[6] In the latter 1960's institutions were having trouble

[6]"Rising Costs and the Public Institutions," AAUP Bulletin, June 1970, p. 177.

keeping up with cost-of-living increases, and most professorial ranks--both in public and private institutions--were affected. Preliminary information reported concerning the 1970-71 status of the profession showed that all-ranks average compensation failed to keep pace with the cost-of-living rise from 1969-70 to 1970-71.[7]

One measure of institutional labor cost is the average faculty salary across all ranks and disciplines and the average salary of administrative staff across all ranks and types of jobs. This measure, unfortunately, combines the effect of changes in salary at each rank or position with the effect of a change in the roster of personnel and the percentage composition of the work force.

Salary Trends for Various Types of Labor

In order to explore the change in unit price *for a given type of labor*, I have put together Table 1, based on the experience of my own institution, the University of California. The university's faculty salaries have been adjusted, over the years, to keep pace with a peer group of major universities; nonacademic salaries have been adjusted in accordance with findings of the California State Personnel Board studies of wage rates in comparable classifications in business and industry throughout the state.

Table 1 shows that weighted average administrative salaries over the twenty-year period rose at just about the same compound annual rate as average faculty salaries, but the latter's rate of rise in the 1960-70

---

[7] At the Brink: Preliminary Report on the Economic Status of the Profession, 1970-71 (Washington: AAUP, April 1971), p. 48.

TABLE 1

University of California Salaries, 1950-70, and Compound Rates of Increase

Labor Category[a]	Salary[b]			Compound Annual Rate of Increase(Percent)	
	1950	1960	1970	1950-70[c]	1960-70
Academic year faculty[d]					
Average faculty salary	$ 6,284	$10,255	$15,505	4.2	3.6
Assistant professor, II	5,040	7,536	10,700	3.8	3.6
Professor, II	8,190	12,900	17,900	4.0	3.3
Teaching assistant, half time	1,200	2,365	3,447	5.4	3.8
Monthly administrative salary[e]					
Average administrative salary	313	432	645	4.1	4.1
Principal clerk, minimum	230	376	530	4.3	3.5
Accountant, minimum	370	676	1,048	5.8	4.5
Principal engineer, minimum	560	950	1,475	5.0	4.5
Librarian, I, minimum	240	415	627	4.9	4.3
Librarian, III, minimum	370	584	820	4.2	3.5
Campus librarian, yearly	10,800	20,325	35,000	6.05	5.6

[a]Roman numerals indicate steps in the salary schedule within the given labor category.

[b]Salary is stated in current dollars for each year, *not* corrected for changes in purchasing power.

[c]For the University of California, no salary range adjustment was made from 1969-70 to 1970-71. For the years 1950-51 to 1969-70, the compound rates of increase were: Average faculty salaries, 4.4%; Assistant professor, II, 4.0%; Professor, II, 4.1%.

[d]Nine-month, academic year salary.

[e]Salary per month, not per year.

decade was lower than that of nonacademic salaries. The averages are an amalgam of the respective job classification wage rates and the (possibly changing) mix of people in the various job classifications. Therefore, we have also shown the compound rates of increase for three administrative job classifications. These rates are significantly higher than those for academic position salaries (see Table 1, rates for both 1950-70 and 1960-70).

We have also shown the salary of teaching assistants for the years in question, where the compound annual rate of increase was 5.4 percent for the 1950-70 interval and 3.8 percent for 1960-70. Finally, three classifications in the library staff are shown. All three librarian positions showed higher rates of salary increase from 1950-70 than did any of the faculty positions.

Two Inferences

Two inferences can be drawn from these data. First, an institution that had a greater-than-average proportion of its employees in the administrative and subfaculty categories in 1950 *and* maintained these proportions from 1950 to 1970 has experienced a greater-than-average upward pressure on its costs. In addition, as we all know from observation of both nonacademic and academic personnel practices, there has been a tendency to upgrade jobs and create supergrades in order to provide opportunities for salary advancement beyond the cost-of-living adjustments. Thus, the average salary of individuals has risen by more than the rates of increase shown in Table 1.

The second inference is that *faculty* have become cheaper, at given ranks and steps, between 1950 and 1970, relative to teaching assistants and administrative staff of given ranks and steps. Institutions have

some choices in determining whether to substitute one form of labor for another. Some institutions experienced little increase in the complexity and technology of their operations between 1950 and 1970. If so, and if they had an optimal balance of faculty with other staff in 1950, the sensible policy over the years would have been to hire relatively more faculty than administrators and, where feasible, substitute faculty labor for the kinds of administrative labor whose costs were increasing faster than faculty salaries.

I have pursued this analysis of unit costs and trends because it counters conventional explanations of the last two decades about cost problems and rational responses to them. According to the conventional argument, faculty salaries are a major cost item, faculty salaries have been rising, and therefore colleges and universities should be finding ways to substitute other kinds of labor for faculty labor. Yet in at least one major institution, the cost of other kinds of labor has increased faster than faculty costs.

Trends in Commodity Prices

As we turn to costs of operation other than labor, again we look for changes in unit prices. Our first objective is to observe what has happened to unit prices *of the same items*. After that, we can look at quality upgrading and increases in volume of various items. The wholesale price index of industrial commodities rose 19.6 percent in total from the base period of 1957-59 to 1971. Individual components of the index show large differentials, however: rubber and plastic products rose only 6.1 percent and furniture and durables rose 10.5 percent, whereas, at the other extreme, metals and metal products rose 29.4 percent and general-purpose

machinery and equipment rose 33.4 percent.

When these price increases for various types of purchased commodities are stated in terms of compound annual rates of increase from 1957-59 to 1971, shown in Table 2, the figures give us greater comparability with the rates of increase of wages in higher education. As shown, prices of purchased commodities have apparently risen over the decade much less rapidly than wages in higher education. Increases in number of commodity units required, relative to other factors, and increased demand for more complex items may, nevertheless, have caused more cost pressure from these components of expenditure than indicated by Table 2. Further, the impact of increased costs may have been particularly strong during the entire last three years of the 1960's, influenced--as was the entire U.S. economy--by the inflation resulting from the Vietnam war. Thus, the relative influence of cost rise in certain types of items has been increased.

TABLE 2

Wholesale Prices, by Major Commodity Groups
(1957-59 = 100)

Commodity	Price Index, 1971	Compound Annual Rate of Increase (Percent), 1957-59 to 1971[a]
All commodities	119.6	1.38
Rubber and plastic products	106.1	0.46
Furniture and durables	110.5	0.77
Metals and metal products	129.4	2.0
General-purpose machinery and equipment	133.4	2.2

[a]1958, mid-point of base period, assumed for start of calculation.

Various types of institutions are, of course, affected differently by the differentials in commodity price increases. However, we can

reasonably suppose that the types of institutions that have experienced rapid capacity growth have also experienced the largest amount of exposure to increases in machinery prices.

Prices of Library Materials

Price trends in library books and serial publications have exerted an influence on budgets in all types of higher education institutions. Unit prices of library books, periodicals, and services have risen at different average rates from the base period of 1957-59 to 1969, books having gone up a total of 77.1 percent, while periodicals rose 89.2 percent and serial services, 98.0 percent over the same interval. These represented, respectively, compound annual rates of 5.3 percent, 6.0 percent, and 6.4 percent.

Recent inflationary pressures hit all three sectors of library acquisition costs. In the one year from 1969 to 1970, the U.S. periodicals index rose from 189.2 to 211.6, or by nearly 12 percent over 1969, and a combined index of serials services rose by 8.4 percent.[8] In the same period, an index of the prices of hardcover books, ranging by field from agriculture to travel, rose overall by 22.7 percent; this same index showed a rise of 38.3 percent during 1967-70, with the greatest increase occurring during 1969. Also during 1969, mass market paperbacks rose in price only 2.1 percent, whereas the more selective, "trade" paperback category rose by 29 percent.[9]

As striking as the average price increase in each category is the

---

[8] Helen W. Tuttle, Norman B. Brown, and William H. Huff, "Price Indexes for 1970, and U.S. Periodicals and Services," Library Journal, July 1970, pp. 2427-29.

[9] Publishers' Weekly, Feb. 8, 1971, pp. 53-54.

great variation among categories in the amount of increase. A few examples of periodicals and serials will illustrate. While business and economics periodicals rose from 1957-59 to 1970 by a total of 82.1 percent, chemistry and physics periodicals rose in price by 233.2 percent, engineering by 123.5 percent, literature by 63.1 percent, and history by only 56.1 percent. Thus, an institution having a heavy periodicals commitment in the hard sciences and engineering would have found more inflationary pressure on its library costs over this interval than one which concentrated on the humanities. Even more striking interfield differences were shown for the serials services, those in law having risen since 1957-59 by 155.7 percent; business 66.5 percent; science and technology, 554.2 percent; and U.S. documents, 48.7 percent. Here again, the specific effects of the increases in unit prices of library materials will depend a great deal on each institution's mix of programs.

EDUCATIONAL RESOURCES USED

Now to be examined are, first, the increases in quantity used of each type of resource for higher education and, next, such fragments of information as we have concerning changes in productivity for each type of resource. In his study, Cheit converted each category of expenditure to expenditure *per student* in each institution, in order to obtain a basis of comparability among institutions. This approach, of course, combines the effects of prices, quantities of a resource used per student, and productivity. It is very difficult to go beyond this approach because dates are scant.

Increases in Personnel

Use of faculty labor has, of course, risen enormously with increases in enrollment in all types of institutions. At the same time, however, student-faculty ratios have apparently increased--that is, *fewer* faculty are being used per thousand students--in all types of institutions.[10] It may be questioned whether the increased number of students per faculty member actually represents an increase in the amount of teaching output per faculty member. Some evidence suggests that in many institutions during the 1960's the number of faculty teaching contact hours per week in regular classes decreased but was accompanied by increases in the amount of faculty time spent in supervising graduate students and increases in class size.

Cutting the problem another way, we find that the total number of faculty in some institutions increased dramatically. At Stanford, for example, the number of members of the Academic Council went from 427 in 1955 to 1,031 in 1970, an increase of 141 percent, compared with an increase of enrollment from 7,870 to 11,600, or 47 percent. But there was a sharp change in the composition of the student body: graduate students accounted for 36 percent in 1955 and 45.5 percent in 1970. Staff other than faculty increased by 161 percent, from 2,220 in 1955 to 5,802 in 1970. Stanford was transformed in those fifteen years by plentiful federal research funds, the generosity of its benefactors, and the drive of its leadership. From 1955 to 1970 its total operating budget rose by 572 percent, the instruction budget rose by 632 percent, the research budget by 669 percent, the library budget by 634 percent, and plant operations by 551 percent. Other major research universities had similar growth, and some public

---

[10] R. Radner and L.S. Miller, "Demand and Supply in U.S. Higher Education: A Progress Report," American Economic Review, May 1970, pp. 326-34.

institutions grew even more in total budget and enrollment.

Note that staff other than faculty increased by a greater percentage than did faculty, that both grew by much more than enrollment (because of growth in research and increased relative emphasis on graduate instruction), and that all of the dollar budgets grew by percentages far greater than either the enrollment growth or the faculty and staff growth. (An increase of 600 percent in fifteen years represents growth at a compound annual rate of 13.9 percent.)

Table 3 illustrates the recent experience of the University of California. During this period, the university's enrollment increased from 65,945 to 95,259 FTE (full-time equivalent) students, or by 44.4 percent.

Educational institutions which have the specified mission of providing the first two years or four years of postsecondary instruction, and which have been constrained by their own policies or by jurisdictional allocations from accumulating research and graduate instructional responsibilities, have experienced growth in enrollment and thus in total faculty (though student-faculty ratios have increased over the past twenty years). They are not, however, as likely as universities to have experienced as costly a *relative* expansion in nonfaculty personnel.

TABLE 3

Growth of Full-Time Faculty and Staff at the University of California, 1962-63 to April 1969

Labor Category	1962-63		April 1969		1969 as Percentage of 1962-63
	Number	Percent	Number	Percent	
Clerical & administrative	17,600	65.1	30,600	67.8	173.9
Teaching assistants	1,100	4.0	1.500	3.3	136.4
Faculty	3,800	13.9	6,600	14.6	173.7
Total employees	27,100	100.0	45,200	100.0	166.8

As academic institutions have grown in size over the past decade or two, they have had available to them some economies of scale in administration resulting in increases in the number of administrative staff less than proportional to growth. For example, the budgeted cost for general administration and institutional services at the several campuses of the University of California in 1969-70 was 3 percent of total state budget at Berkeley, with 27,300 students, 4 percent at Santa Barbara with 13,300 students, and 6 percent at Irvine with 4,300 students. At the same time, we know that colleges and universities have become more complex institutions to administer over this period, and, as cited above, some have expanded administrative staffs relative to academic staff. Such increases have introduced another independent source of cost increase, for often the increases in proportion are in precisely those types of personnel whose costs rose the most rapidly.

Library Growth

Let us now consider the increase in quantity of library resources. The previous discussion of unit price trends showed that book, periodical, and serial prices rose at a more rapid rate than salaries, and the major research universities experienced enormous expenditure increases for library materials through the past two decades. But in public two-year and four-year institutions which experienced major enrollment growth, especially in the 1960's, a frequent budgetary device has been to provide funds for a certain number of books per FTE student. Quite natural desires to improve library resources have led to increases in the budgeted factor over time. From 1965-66 to 1971-72 (estimated), the California State College System will have increased the number of volumes per FTE student

from 27 to 35.5. In this same seven-year period, total library holdings more than doubled, from 3.2 million volumes to 7.5 million volumes.

Equipment

Expansion of the equipment base of academic institutions was also rapid during the enrollment upsurge of the 1950's and particularly the 1960's. The mechanical core of buildings became more expensive and more elaborate. One simple example is air conditioning: in 1960-61, only 14 percent of the University of California's total building area was air-conditioned; in 1970-71, after a huge expansion of total space, 40 percent was air-conditioned, with large cost consequences not only in initial capital outlay but also in subsequent maintenance and utilities expense. In addition, numerous colleges and universities, to conserve scarce land, have had to build high-rise buildings. Again, basic construction methods and more mechanical equipment make these more expensive per square foot at the time of construction, and also result in higher maintenance costs in subsequent use.

Scientific equipment has also increased in complexity. Electron microscopes cost about $30,000 in 1960, and, with improvements and design conveniences, about $50,000-$60,000 in 1970.

Computers are an example of equipment whose unit cost has fallen rapidly and continuously with technological advance, but the decreases in unit prices have been much more than offset by increases of usage. In a ten-university study of rising costs, published in 1967, computers were shown to represent 0.3 percent of operating budget in 1961-62, 1.0 percent in 1966-67, and were projected to be 1.7 percent in 1972-73.[11]

---

[11] Study of Rising Costs at Ten Universities (Ithaca, N.Y.: Cornell University, September 1967).

Although we have concentrated on prices and quantities of operating resources in this paper, it should at least be noted that new construction has had a high and rising rate of increase. In the past three years, depending on the type of construction, the cost index has risen at 10-12 percent per year.

Security Cost Rise

In the past three or four years, insurance premiums, fire and other damage losses, and personnel costs for security have risen very rapidly. Fire and casualty insurance rates have risen throughout the economy, but, with the spread of student unrest, academic institutions became a new kind of risk. To keep dollar premium rates from rising too high, institutions have been forced to increase the deductible limit for each occurrence--an action that, in turn, forces them to absorb fire and other damage losses from their own resources. Cheit cites these expense increases as a common theme among most of the institutions he surveyed. He finds that total costs of "campus disturbance"--insurance, security, property maintenance and repair increases, and diversions of staff time--amounted to 4.746 percent of educational and general expenditures in 1969-70 at one institution; and he offers the judgment that one percentage point of the cost push in each of the past three years came from this source alone.[12]

Student Financial Aid

Increased financial aid to students is a final element of important growth in the cost structure of many institutions. Those public institutions

[12] The New Depression in Higher Education, pp. 108-10.

which have sought, successfully, to secure added appropriations for student aid and especially for education opportunity programs have experienced offsetting increases in both income and expense from this activity. But many private institutions which have increased their income by raising tuition have felt obliged to devote a significant portion of the new revenue to financial aid for needy students, and many have also accepted new financial responsibilities toward minority students formerly underrepresented in their enrollment. It has been of great importance to American society that our colleges and universities, both public and private, undertake these new responsibilities. But their discretionary resources are clearly not adequate to do the job of redressing deep imbalances in the previous distribution of income, assets, and educational opportunity. There is a strong case for new federal finance to meet this need.

AN APPRAISAL

We must now step back from details and appraise the overall consequences of the cost push and the failure of institutional income to keep pace with costs. Many of the figures cited go back one or two decades and show that the seeds of financial difficulty for higher education were germinating for a long time. The inflation associated with the Vietnam war has clearly accelerated the cost push of some major elements. The growing competition for the federal and state program dollar has worsened the lot of research universities and public institutions. The private institution, worrying about whether to raise tuition still further, faces market resistance to the prices it must charge.

The rate of inflation may be moderating. Cheit and others point to the hope that some of the effects of unrest on institutional expenditure may be tapering off. Many colleges also hope that they are repairing the breach of confidence with legislative and private funding constituencies, with possible beneficent effects on future income.

Provost William G. Bowen of Princeton University has suggested a fundamental relationship which may pertain to all of higher education: that higher education may be a constant-productivity "industry" surrounded by other sectors of society whose productivity is rising several percent per year.[13] Bowen shows long-term comparisons (1905-66) of direct costs per student in higher education with an economy-wide cost index, as well as detailed cost experience of a sample group of major universities. The data seem to show a continued *relative* cost rise for higher education. To get out of this trap, academic institutions can try to gain whatever economies of scale are available to some of them and also use more capital and technology per staff member *where this might cut costs per student.* But Bowen raises a problem that, in the absence of significant productivity gains in the use of resources for higher education, could be dealt with only by cutting the quality of educational operations as we have known them, by reducing the real wages of those who earn their living in higher education, or by continuing to raise the tuition cost and the public subsidy to higher education.

Not much progress has been made in measuring educational output or

---

[13] "Economic Pressures on the Major Private Universities," in The Economics and Financing of Higher Education in the United States: A Compendium of Papers Submitted to the Joint Economic Committee, Congress of the United States (Washington: Government Printing Office, 1969), pp. 399-439. In his paper, Bowen drew on his The Economics of the Major Private Universities (Berkeley, Calif.: Carnegie Commission on Higher Education, 1968).

educational quality.[14] With the development of such measures and with a new address to the improvement of the productivity of higher education, there might be some hope of moderating the cost push. These approaches will take a great deal of time, money, and--above all--courage.

Meanwhile, for the balance of the decade, continued cost pressures must be anticipated with the continued growth of total college enrollments. It seems likely that the public two-year colleges are the type of institution whose cost structure will be least vulnerable to further rapid increases of operating cost per student because they rely most heavily on academic personnel, not other types, and they face fewer urgent needs in other areas of rapid cost increase such as library expansion. To the extent that two-year colleges find that they must expand their higher-cost-per-student technical-vocational programs more rapidly than their academic programs, however, they too will have new cost pressures; and those community colleges which have a vital role as gateways to new educational opportunity face intense demands for counseling and other educational services.

Beyond the 1970's there will be, for many institutions, a new problem of living with absolute retrenchment, for total college enrollments will probably fall for several years in the early 1980's.

This paper has dealt with cost and income influences on institutions with stable or growing levels of activity. This has been and, for the 1970's, will be the environment of most institutions. As institutions look some years ahead to the problems of adjusting to possible future

---

[14] The author contributed an essay, "Thinking about the Outputs of Higher Education," to a seminar on this subject which included as well a number of interesting contributions, reported in The Outputs of Higher Education (Boulder, Colo.: Western Interstate Commission on Higher Education, 1970).

decreases in the size of their operations (as indeed some of them are already having to do in research areas), it will be necessary to consider, by means of analysis that is beyond the scope covered here, how to plan the withdrawal of resources from each domain of the institution's activity.

EPILOGUE

Additional evidence concerning trends in expenditures and income has become available through the courtesy of Dr. Hans Jenny, coauthor with G. Richard Wynn of The Golden Years.[15] They will soon publish After the Golden Years, an updating of income and expenditures in forty-eight four-year colleges.[16]

For the full decade of the 1960's, Jenny reports that these colleges had compound anrual rates of income growth per student of 6.4 percent, while the like rate of growth in expense per student was 6.8 percent; thus, for the decade, the "gap" was 0.4 percent per year. This rate is less than the average shown by Cheit in his study of forty-one institutions of several types. Jenny finds, however, that his very recent figures, for 1968-70, show a much larger gap--income growth of 6.8 percent per student per year as against 8.2 percent yearly growth of expense. Student aid expense had much the most rapid growth rate of all the expense categories. He has also calculated the year-to-year marginals--the changes in income and expense--and finds that for 1960-61 about eight cents of each dollar of extra tuition and fee income went to student aid, whereas for 1969-70, thirty-two cents went to student aid.

---

[15] Hans H. Jenny and G. Richard Wynn, The Golden Years: A Study of Income and Expenditure Growth and Distribution of 48 Private Four-Year Liberal Arts Colleges, 1960-1968, The College of Wooster, Wooster, Ohio, 1971.

[16] After the Golden Years is to be published in 1972 by the College of Wooster.

Dr. Jenny has provided the author with some conclusions and observations, summarized here as follows: (1) There are real differences in the economic pressures on different types of institutions, and, in particular, the four-year colleges have limited room for maneuver on both the cost and expense sides. (2) Among all categories of operating expenditure, student aid expense has had to grow the most rapidly, and that total is approximately the total size of the "subsidy" gap in the forty-eight colleges he studied. (3) In addition to the focus that he, Cheit, and the present author have all had on operating income and expense, there should be detailed study of the capital accounts of higher education, an area which has unfortunately not received detailed analytical treatment.